IN THE CLAIMS:

1. (Original) A MIG welding power source comprising:

a raw power input configured to receive a raw power signal for a MIG welding process, the raw power signal having a voltage level of at least approximately 115V;

an inverter configured to receive the 115V signal and provide a welding output suitable for MIG welding; and

a welding power output configured to supply the welding output for a MIG welding process.

2. (Original) The power source of claim 1 configured to provide one of a CC and a CV output.

3. (Original) The power source of claim 1 having a weight of approximately 35 pounds.

4. (Original) The power source of claim 1 wherein the raw power input is further configured to receive an approximate 230V power signal.

5. (Original) The power source of claim 1 further comprising a terminal configured to receive a control cable connected to a wire feeder.

6. (Original) The power source of claim 1 further comprising a power factor correction circuit configured to provide a near unity power factor.

7. (Original) A method of regulating a power source having an 115V inverter to condition raw power into a form usable by a MIG welding process, the method comprising the step of:

determining a maximum allowable voltage error given an output condition at a weld;

determining an instantaneous command current given the maximum allowable voltage error; and

inputting a signal proportional to the instantaneous command current to a controller of the 115V inverter, the signal designed to regulate the controller to provide a control signal to regulate an output of the 115V inverter.

8. (Original) The method of claim 7 further comprising the step of inputting a signal indicative of the instantaneous command current to regulate what level of output the 115V inverter should generate.

9. (Original) The method of claim 7 further comprising the step of pulse width modulating the 115V inverter to regulate the output of the 115V inverter.

10. (Original) The method of claim 7 wherein the step of determining a maximum allowable voltage error includes the step of subtracting a voltage feedback signal from the weld from a voltage command signal.

11. (Original) The method of claim 7 further comprising the step of controlling the 115V inverter to produce either a CC or a CV output.

12. (Original) The method of claim 7 further comprising the steps of:

detecting a welding state at a weld;

limiting output current to a predetermined maximum level during an arc phase at the weld; and

limiting output current to an instantaneous maximum level based on instantaneous welding parameters during a short circuit at the weld.

13. (Original) The method of claim 12 further comprising the steps of:

monitoring duration of a short circuit at the weld;

comparing the duration to a default value; if the duration exceeds the default value

allowing output current to increase to a clear level; and if the short circuit persists taking remedial action to clear the short circuit.

14. (Original) The method of claim 13 further comprising the step of either shutting off the 115V inverter or retracting wire from the weld if the short circuit persists when the output current is at the clear level.

15. (Original) The method of claim 13 further comprising the step of lowering the output current to a level lower than the clear level if the short circuit clears when the output current is at the clear level.

16. (Original) The method of claim 15 further comprising the step of allowing the 115V inverter to output power greater than a normal output power rating during a post-short circuit condition.

17. (Original) A MIG welding system comprising:

a power source having an 115V inverter configured to condition a raw power input into a form usable by a MIG welding process;

a wire feeder connected to the power source and configured to introduce a consumable electrode to a weld; and

an electrode holder configured to receive the consumable electrode and place the consumable electrode in relative proximity to a workpiece at the weld.

18. (Original) The MIG welding system of claim 17 wherein the power source is configured to provide either a CC or a CV output.

19. (Original) The MIG welding system of claim 17 wherein the wire feeder is configured to feed a consumable electrode having a diametric thickness of approximately 0.024 inches.

20. (Original) The system of claim 17 wherein the power source includes a power factor correction circuit designed to provide a near-unity power factor.

21. (Original) The system of claim 17 wherein the power source and the wire feeder are portable.

22. (Original) The system of claim 17 wherein the consumable electrode includes one of steel, stainless steel, and aluminum.

23. (Original) The system of claim 17 wherein the power source includes operational circuitry designed to provide a 400VDC bus to be input to the 115V inverter.

24. (Original) The system of claim 17 wherein the power source includes a controller designed to pulse width modulate output of the inverter.

25. (Original) A method of controlling output of a MIG welding power source, the method comprising the steps of:

detecting a prolonged short circuit at a weld;

increasing output current at a first ramp rate so as to clear the prolonged short circuit; and

increasing output current at a second ramp rate once the output current reaches a pre-set threshold.

26. (Original) The method of claim 25 wherein the first ramp rate is less than the second ramp rate.

27. (Original) The method of claim 25 further comprising the step of monitoring a time period of the short circuit and if the time period exceeds a pre-set threshold, increasing the output current at the second ramp rate independent of the output current relative to the pre-set threshold.

28. (Original) The method of claim 25 further comprising the step of shutting down the power source if the prolonged short circuit remains after the output is increased at the second ramp rate.

29. (Original) The method of claim 25 further comprising the step of setting the first ramp rate based on at least thickness of a wire being fed to the weld.

30. (Original) The method of claim 29 wherein the first ramp rate includes approximately 10 Amps/msec and the second ramp rate includes approximately 100-200 Amps/msec.

31. (Original) The method of claim 25 wherein the pre-set threshold includes approximately 50-60 Amps.